

What is Claimed is:

1. A method of managing a wireless local area network, comprising:
 - receiving floor plan data about a site for the wireless local area network;
 - receiving coverage data about the site for the wireless local area network;
 - 5 receiving capacity data about the site for the wireless local area network;
 - based at least on the floor plan data, the coverage data, and the capacity data, determining quantity, placement, and configuration of a plurality of access points of the wireless local area network;
 - receiving measured wireless local area network data;
 - 10 comparing the measured wireless local area network data with expected wireless local area network data, the expected wireless local area network data generated at least from the floor plan data about the site of the wireless local area network, and the quantity, the placement, and the configuration of the plurality of access points of the wireless local area network; and
 - 15 based at least on the measured wireless local area network data, changing one or more of: the floor plan data about the site of the wireless local area network, the quantity of the plurality of access points, the placement of the plurality of access points, and the configuration of the plurality of access points.
- 20 2. The method of claim 1 wherein the floor plan data is imported.
3. The method of claim 1 wherein the floor plan data is manually drawn via computer.
- 25 4. The method of claim 1 wherein objects in the floor plan data are associated with radio frequency attenuation factors.
5. The method of claim 4 wherein objects in the floor plan data are associated with radio frequency attenuation factors that depend on a technology standard of the wireless
30 local area network.
6. The method of claim 1 wherein the coverage data indicates coverage areas of the site serviced by the plurality of access points.

7. The method of claim 6 wherein the coverage data is indicated with at least the floor plan data.
8. The method of claim 6 wherein the coverage data depends on a technology
5 standard of the wireless local area network.
9. The method of claim 8 wherein at least one coverage area supports one or more technology standards of the wireless local area network
- 10 10. The method of claim 1 further comprising:
receiving wiring closet data, the wiring closet data indicating one or more locations for one or more distribution system switches at the site for the wireless local area network, the one or more distribution system switches connecting to the plurality of access points.
- 15 11. The method of claim 10 wherein determining quantity, placement, and configuration of the plurality of access points of the wireless local area network is further based at least on the wiring closet data.
12. The method of claim 10 wherein the wiring closet data includes redundant
20 connection data to the plurality of access points.
13. The method of claim 1 further comprising:
based at least on the floor plan data, the coverage data, and the capacity data, determining at least one of quantity, placement, and configuration of one or more
25 distribution system switches at the site for the wireless local area network, the one or more distribution system switches connecting to the plurality of access points.
14. The method of claim 13 further comprising:
determining connections between the one or more distribution system switches and
30 the plurality of access points.
15. The method of claim 1 wherein the capacity data includes one or more throughput rates for stations serviced by the plurality of access points.

16. The method of claim 1 wherein the capacity data includes one or more average desired association rates for stations serviced by the plurality of access points.
17. The method of claim 1 wherein the capacity data includes one or more quantities of stations serviced by the plurality of access points.
18. The method of claim 17 wherein the capacity data includes one or more quantities of active stations serviced by the plurality of access points.
19. The method of claim 17 wherein the capacity data includes one or more quantities of total stations serviced by the plurality of access points.
20. The method of claim 1 further comprising:
receiving association data.
21. The method of claim 20 wherein determining quantity, placement, and configuration of the plurality of access points of the wireless local area network is further based at least on the association data.
22. The method of claim 20 wherein the association data includes allowable channels for the plurality of access points.
23. The method of claim 20 wherein the association data includes one or more minimum rates for beacons of the plurality of access points.
24. The method of claim 20 wherein the association data includes one or more minimum rates for probe responses of the plurality of access points.
25. The method of claim 1 wherein the configuration of the plurality of access points of the wireless local area network determined based at least on the floor plan data, the coverage data, and the capacity data, includes multi-homing for the plurality of access points.

26. The method of claim 1 wherein the configuration of the plurality of access points of the wireless local area network determined based at least on the floor plan data, the coverage data, and the capacity data, includes power levels for the plurality of access points.

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27. The method of claim 1 wherein the configuration of the plurality of access points of the wireless local area network determined based at least on the floor plan data, the coverage data, and the capacity data, includes channel assignments for the plurality of access points.

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28. The method of claim 1 wherein the placement of the plurality of access points of the wireless local area network determined based at least on the floor plan data, the coverage data, and the capacity data, is manually adjustable via computer.

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29. The method of claim 28 further comprising:
based at least on manually adjusted placement of the wireless local area network, determining at least one of the quantity and the configuration of the plurality of access points.

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30. The method of claim 28 further comprising:
based at least on manually adjusted placement of at least one access point of the wireless local area network, determining the placement of at least one other access point of the plurality of access points.

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31. The method of claim 28 further comprising:
based at least on manually adjusted placement of at least one access point of the wireless local area network, determining at least one of the coverage data and the capacity data of the site for the wireless local area network.

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32. The method of claim 1 further comprising:
displaying at least the quantity and the placement of the plurality of access points of the wireless local area network.

33. The method of claim 1 further comprising:
permitting manual adjustments via computer to one or more of: the quantity and
the configuration of the plurality of access points of the wireless local area network.
- 5 34. The method of claim 33 further comprising:
based at least on the manual adjustments, determining at least one of the quantity,
the placement, and the configuration of the plurality of access points.
- 10 35. The method of claim 33 further comprising:
based at least on manual adjustments, determining at least one of the coverage data
and the capacity data of the site for the wireless local area network.
36. The method of claim 1 further comprising:
15 receiving preexisting access point data.
37. The method of claim 36 wherein determining quantity, placement, and
configuration of the plurality of access points of the wireless local area network is further
based at least on the preexisting access point data.
- 20 38. The method of claim 1 further comprising:
generating work order data based at least on the quantity, the placement, and the
configuration of the plurality of access points of the wireless local area network.
- 25 39. The method of claim 38 wherein the work order data includes installation
instructions for the plurality of access points of the wireless local area network.
40. The method of claim 39 wherein the work order data includes installation
instructions for one or more distribution system switches connecting to the plurality of
30 access points of the wireless local area network.

41. The method of claim 1 further comprising:
pushing distribution system switch configurations to one or more distribution
system switches at the site for the wireless local area network, the one or more distribution
5 system switches connecting to the plurality of access points.
42. The method of claim 41 wherein the distribution system switch configurations
include management settings.
- 10 43. The method of claim 42 wherein the management settings include one or more of:
HTTPS settings, telnet settings, SNMP settings, logging settings, and time zone settings.
44. The method of claim 41 wherein the distribution system switch configurations
include IP service settings.
- 15 45. The method of claim 44 wherein the IP service settings include one or more of:
static route settings, IP alias settings, DNS settings, and NTP settings.
46. The method of claim 41 wherein the distribution system switch configurations
20 include authentication settings.
47. The method of claim 41 wherein the distribution system switch configurations
include distribution system switch port settings.
- 25 48. The method of claim 47 wherein the distribution system switch port settings
includes settings for distribution system switch ports connected to access points of the
plurality of access points.
49. The method of claim 41 wherein the distribution system switch configurations
30 include distribution system switch VLAN settings.
50. The method of claim 49 wherein the VLAN settings include one or more of:
VLAN name settings, tunnel affinity settings, IP address settings, aging time settings,

distribution system switch port VLAN settings, STP settings, IGMP settings, and static multicast port settings.

51. The method of claim 50 wherein the distribution system switch port VLAN
5 settings specify membership of distribution system switch ports in VLANs.
52. The method of claim 1 further comprising:
pushing access point configurations to one or more access points of the plurality of
access points.
- 10 53. The method of claim 52 wherein the access point configurations include SSID
settings.
54. The method of claim 53 wherein the SSID settings include at least one of:
15 beacons SSID settings, encrypted data SSID settings, and unencrypted data SSID
settings.
55. The method of claim 52 wherein the access point configurations include encryption
settings.
- 20 56. The method of claim 55 wherein the encryption settings include at least one of:
encryption standard settings and encryption key settings.
57. The method of claim 52 wherein the access point configurations include 802.11
25 settings.
58. The method of claim 53 wherein the 802.11 settings include at least one of: beacon
interval settings, DTIM period settings, fragment threshold settings, long retry limit
settings, maximum send lifetime settings, maximum receive lifetime settings, RTS/CTS
30 settings, short retry limit settings, preamble settings, transmit power settings, channel
number settings, and minimum transmit rate settings.
59. The method of claim 1 wherein the measured wireless local area network data
includes radio frequency measurements.

60. The method of claim 59 wherein the measured wireless local area network data includes measured radio frequency signal strength data from the radio frequency measurements and the expected wireless local area network data includes expected radio frequency signal strength data.
61. The method of claim 59 wherein the measured wireless local area network data includes measured channel data from the radio frequency measurements and the expected wireless local area network data includes expected channel data.
62. The method of claim 59 wherein the measured wireless local area network data includes measured access point position data of the plurality of access points from the radio frequency measurements and the expected wireless local area network data includes expected access point position data of the plurality of access points.
63. The method of claim 59 wherein the measured wireless local area network data includes media access control address data associated with the radio frequency measurements and the expected wireless local area network data includes expected media access control address data.
64. The method of claim 1 wherein changing the floor plan data includes making one or more changes in objects in the floor plan data associated with radio frequency attenuation factors.
65. The method of claim 1 wherein changing the floor plan data includes making one or more changes in radio frequency attenuation factors associated with objects in the floor plan data.
66. The method of claim 1 further comprising:
based at least on the measured wireless local area network data, changing one or more of: at least one of quantity, placement, and configuration of one or more distribution system switches at the site for the wireless local area network, the one or more distribution system switches connecting to the plurality of access points.

67. The method of claim 1 wherein changing the configuration of the plurality of access points includes making one or more changes in power levels for the plurality of access points.
- 5 68. The method of claim 1 wherein changing the configuration of the plurality of access points includes making one or more changes in channel assignments for the plurality of access points.
69. The method of claim 1 further comprising:
- 10 generating work order data based at least on the one or more changes for one or more of: the floor plan data about the site of the wireless local area network, the quantity of the plurality of access points, the placement of the plurality of access points, and the configuration of the plurality of access points.
- 15 70. The method of claim 69 wherein the work order data includes installation instructions for the plurality of access points of the wireless local area network.
71. The method of claim 70 wherein the work order data includes installation instructions for one or more distribution system switches connecting to the plurality of
- 20 access points of the wireless local area network.
72. The method of claim 1 further comprising:
- displaying coverage data based at least on the measured wireless local area network data.
- 25 73. The method of claim 1 further comprising:
- displaying capacity data based at least on the measured wireless local area network data.
- 30 74. The method of claim 1 further comprising:
- displaying floor plan data based at least on the measured wireless local area network data.

75. The method of claim 59 wherein the radio frequency measurements include access point radio frequency measurements taken by access points of the plurality of access points.
- 5 76. The method of claim 75 wherein the access points of the plurality of access points take the radio frequency measurements by at least listening to wireless local area network traffic.
77. The method of claim 1 wherein the measured wireless local area network data
10 include network statistics.
78. The method of claim 77 wherein the network statistics include one or more of: Ethernet statistics, Ethernet errors, radio statistics, and session statistics.
- 15 79. The method of claim 77 wherein the network statistics are collected for one or more of: the site of the wireless local area network, one or more buildings of the site of the wireless local area network, one or more floors of the site of the wireless local area network, one or more portions of the site of the wireless local area network, one or more distribution system switches connecting to the plurality of access points, one or more
20 access points of the plurality of access points, and one or more ports of the one or more distribution system switches.
80. The method of claim 77 wherein the network statistics include one or more of: octet data, packet data, and error data.
- 25 81. Code managing a wireless local area network, comprising:
code that performs receiving floor plan data about a site for the wireless local area network;
code that performs receiving coverage data about the site for the wireless local area
30 network;
code that performs receiving capacity data about the site for the wireless local area network;

- code that performs, based at least on the floor plan data, the coverage data, and the capacity data, determining quantity, placement, and configuration of a plurality of access points of the wireless local area network;
- code that performs receiving measured wireless local area network data;
- 5 code that performs comparing the measured wireless local area network data with expected wireless local area network data, the expected wireless local area network data generated at least from the floor plan data about the site of the wireless local area network, and the quantity, the placement, and the configuration of the plurality of access points of the wireless local area network; and
- 10 code that performs, based at least on the measured wireless local area network data, changing one or more of: the floor plan data about the site of the wireless local area network, the quantity of the plurality of access points, the placement of the plurality of access points, and the configuration of the plurality of access points.
- 15 82. An apparatus managing a wireless local area network, comprising:
- means for receiving floor plan data about a site for the wireless local area network;
- means for receiving coverage data about the site for the wireless local area network;
- means for receiving capacity data about the site for the wireless local area network;
- 20 means for, based at least on the floor plan data, the coverage data, and the capacity data, determining quantity, placement, and configuration of a plurality of access points of the wireless local area network;
- means for receiving measured wireless local area network data;
- means for comparing the measured wireless local area network data with expected
- 25 wireless local area network data, the expected wireless local area network data generated at least from the floor plan data about the site of the wireless local area network, and the quantity, the placement, and the configuration of the plurality of access points of the wireless local area network; and
- means for, based at least on the measured wireless local area network data,
- 30 changing one or more of: the floor plan data about the site of the wireless local area network, the quantity of the plurality of access points, the placement of the plurality of access points, and the configuration of the plurality of access points.